



US007946489B2

(12) **United States Patent**
Gelbman

(10) **Patent No.:** **US 7,946,489 B2**
(45) **Date of Patent:** ***May 24, 2011**

(54) **ELECTRONIC-INK BASED
WRITING/DRAWING AND DISPLAY DEVICE
EMPLOYING AN ACTIVATOR MODULE
MOUNTED BENEATH THE SURFACE OF AN
ELECTRONIC-INK DISPLAY STRUCTURE**

(56) **References Cited**

U.S. PATENT DOCUMENTS

3,668,106 A 6/1972 Ota
(Continued)

FOREIGN PATENT DOCUMENTS

EP 1058147 A2 12/2000
(Continued)

OTHER PUBLICATIONS

Chiang, A., et al., "A Stylus Writable Electrophoretic Display Device", SID 79 Digest (1979), 4.

(Continued)

Primary Examiner — Michael G Lee

Assistant Examiner — Kristy A Haupt

(74) *Attorney, Agent, or Firm* — Thomas J. Perkowski, Esq., P.C.

(75) **Inventor:** **Alexander Gelbman**, Mountain Lakes, NJ (US)

(73) **Assignee:** **Metrologic Instruments, Inc.**, Blackwood, NJ (US)

(*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) **Appl. No.:** **12/214,268**

(22) **Filed:** **Jun. 17, 2008**

(65) **Prior Publication Data**

US 2009/0014540 A1 Jan. 15, 2009

Related U.S. Application Data

(63) Continuation of application No. 12/154,427, filed on May 22, 2008, which is a continuation of application No. 11/196,776, filed on Aug. 2, 2005, now abandoned, which is a continuation of application No. 09/393,553, filed on Sep. 10, 1999, now Pat. No. 6,924,781.

(60) Provisional application No. 60/099,888, filed on Sep. 11, 1998.

(51) **Int. Cl.**
G06K 7/08 (2006.01)

(52) **U.S. Cl.** **235/451**; 235/383; 235/375; 235/492;
235/385; 340/5.91

(58) **Field of Classification Search** 235/451,
235/383, 375, 492, 385; 340/5.91

See application file for complete search history.

(57) **ABSTRACT**

An electronic-ink based writing/drawing and display device employing an addressable display assembly including a layer of electronic ink including a bi-stable non-volatile imaging material. The device includes an integrated circuit structure having a storage element for storing instructions, programs and data, including graphical input data provided by an activator module. The integrated circuit structure also includes a programmed processor in communication with the storage element. The activator module is mounted beneath the surface of the addressable display assembly to (i) determine graphical indicia to be selected and/or displayed on the addressable display assembly, (ii) allow graphical indicia being displayed on the addressable display assembly, to be modified in real-time by a user of the device, and (iii) allow graphical indicia to be displayed on the addressable display assembly while graphical input data is being provided to the programmed processor by said activator module, so that the user is enabled to write and/or draw on the surface of the addressable display assembly while graphical indicia is being displayed thereon.

15 Claims, 7 Drawing Sheets

